

REMARKS

Claims 1-45 are pending in the application. In this response, claims 1, 3, 5, 14, 18, 29-30 and 40 are amended, and claims 4, 17, 20 and 41-45 are cancelled.

Claims 1 and 3 are amended to incorporate the subject matter of the original claim 4, and these amended claims are also supported in the specification, for example, on page 10, lines 13-16.

Claims 14 and 29 are amended to clarify that the internal surfaces of at least one of the substrate and the cover are reflective. This amendment is supported in the specification, for example, on page 13, lines 7-9. Claim 14 is also amended to clarify that the parallel grooves are elongate structures. This amendment is supported in the specification, for example, in Fig. 1A, which shows the structures as conduits for a migration medium.

Claim 18 is amended to incorporate the contents of the original claim 20.

Claim 30 is amended to specify that the third wall of the solid lightguide is reflective. This amendment is supported in the specification on page 10, lines 13-16.

Claim 40 is amended to specify that at least one internal surface of the lightguide cell is at least partially reflective. This amendment is supported in the specification, for example, on page 14, lines 7-10.

In view of the above amendments and the following remarks, Applicants respectfully request further examination of the application and reconsideration of the rejections set forth in the Final Office Action dated August 19, 2004. In view of the attached Request for Continued Examination, Applicants respectfully request entry into the record of the amendments set forth above.

I. Anazawa et al.

On page 2 of the Final Office Action, paragraph 1, claims 1-3, 6, 8-13 and 30-37 are rejected under 35 U.S.C. 102(b) as anticipated by Anazawa et al. (US Patent No. 5,938,908). On page 6 of the Final Office Action, paragraph 1, claim 7 is rejected under 35 U.S.C. 103(a) as obvious over Anazawa in view of Mizuno et al. (US 6,542,691). On page 8 of the Final Office Action, paragraph 4, claim 38 is rejected under 35 U.S.C. 103(a) as obvious over Anazawa et al. in view of Giallorenzi et al. (US 3,963,310).

In response to this rejection, claim 1 is amended to incorporate the subject matter of original claim 4, which was indicated to be allowable. Therefore, applicants respectfully submit that claim 1, as well as claims 2-3 and 5-13 that depend directly or indirectly therefrom, are allowable over Anazawa et al. considered alone or in combination with Mizuno et al.

Similarly, claim 30 is also amended to specify that an internal surface of the lightguide is reflective. Applicants respectfully submit that claims 30-39 as amended are allowable over the cited Anazawa et al. reference, whether considered alone or in combination with Giallorenzi et al..

Reconsideration and withdrawal of the cited rejections are respectfully requested.

II. Ishikawa et al.

On page 3 of the Final Office Action, paragraph 2, claims 14, 16 and 17 are rejected under 35 U.S.C. 102(b) as anticipated by Ishikawa et al. (US 5,061,029). This rejection is respectfully traversed for the reasons that follow.

Claim 14 as amended is directed to a grooved substrate and corresponding cover. At least one of the substrate and the cover has a reflective internal surface. Light entering the lightguide from a direction normal to the longitudinal axis of the grooves is totally internally reflected at an interior surface of the cover and an interior surface of the substrate to illuminate the grooves.

In contrast, in the apparatus in Ishikawa, the total internal reflection takes place not at the interior surfaces of the substrate and cover, but at the interface between the clad 33a and the core 33b of the conduits (col. 4, lines 4-13). Ishikawa does not teach or suggest use as a lightguide of the reflective internal surfaces of the material surrounding the conduits, and for at least this reason Applicants respectfully submit that claims 14 and 16 are neither anticipated by, nor obvious in view of Ishikawa. Reconsideration and withdrawal of the cited rejection are respectfully requested.

III. Kroy et al.

On page 4 of the Final Office Action, paragraph 3, claims 14-16 are rejected under 35 U.S.C. 102(b) as anticipated by Kroy et al. (US 5,532,294). This rejection is respectfully traversed for the reasons that follow.

Kroy describes the use of a light waveguide to distribute light to a plurality of microcavities. Discrete optical fibers deliver light to the cavities.

In contrast, claim 14 as amended is directed to elongate grooves surrounded by a lightguide with internal reflective surfaces. The lightguide surrounds the grooves, and light entering the lightguide is internally reflected at the internal surfaces thereof to provide enhanced illumination of the materials flowing through the grooves. The cited Kroy reference fails to teach or suggest the application of the internal reflective surfaces of a lightguide to enhance sample illumination, and for at least this reason Applicants respectfully submit that claim 14-16 are neither anticipated by nor obvious in view of Kroy. Reconsideration and withdrawal of the cited rejection are respectfully requested.

IV. Dhadwal et al.

On page 4 of the Final Office Action, paragraph 4, claims 18, 19, 24, 28, 29, 40 and 42-45 are rejected under 35 U.S.C. 102(b) as anticipated by Dhadwal et al. (US 5,790,727). On page 7 of the Office Action, paragraph 2, claim 26 is rejected under 35 U.S.C. 103(a) as obvious over Dhadwal in view of Anazawa et al. (US 5,938,908). On page 7 of the Office Action, paragraph 3, claim 27 is rejected under 35 U.S.C. 103(a) as obvious over Dhadwal et al. in view of Ishikawa et al. (US 5,061,029).

In response to these rejections, the subject matter of claim 20 is incorporated into claim 18. Since claim 20 was indicated to be allowable, applicants respectfully submit that claim 18, as well as claims 19 and 21-28 that depend directly or indirectly therefrom, are allowable over Dhadwal et al, whether considered alone or in combination with Anazawa et al. and/or Ishikawa et al.

Claims 29 and 40 are amended to specify that the interior surfaces of the lightguide are reflective. Reflections from these surfaces provide improved illumination of the migration medium. This application of the reflective properties of the internal surfaces of the surrounding medium is neither taught nor suggested in the Dhadwal reference, which teach that the capillaries themselves form a lightguide. For at least this reason, Applicants respectfully submit that claims 29 and 40 are neither anticipated by nor obvious in view of Dhadwal et al.

Reconsideration and withdrawal of the cited rejections are respectfully requested.

CONCLUSION

In view of the above amendments, Applicants respectfully submit that all claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims.

Please charge any additional fees or credit any overpayment to deposit account number 50-1778.

If questions remain regarding the above, or if the Examiner wishes to discuss any aspect of this application, please contact the undersigned.

Date:

February 22, 2005

SHUMAKER & SIEFFERT, P.A.

8425 Seasons Parkway, Suite 105

St. Paul, Minnesota 55125

Telephone: 651.735.1100

Facsimile: 651.735.1102

By:



Name: H. Sanders Gwin, Jr.

Reg. No.: 33,242



1/14

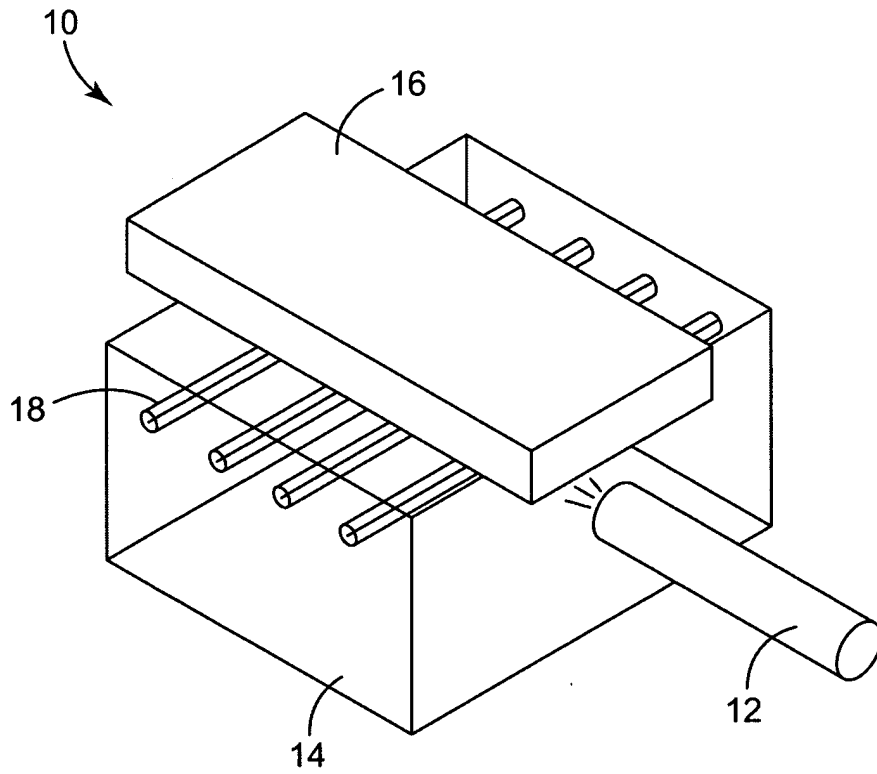


FIG. 1A

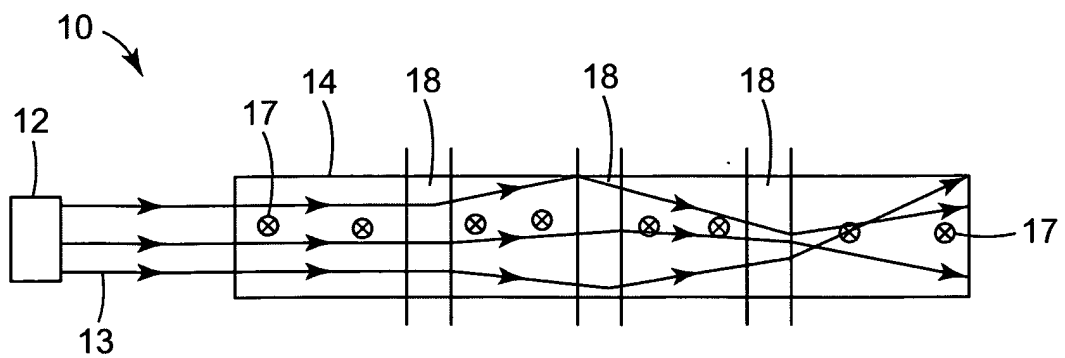


FIG. 1B

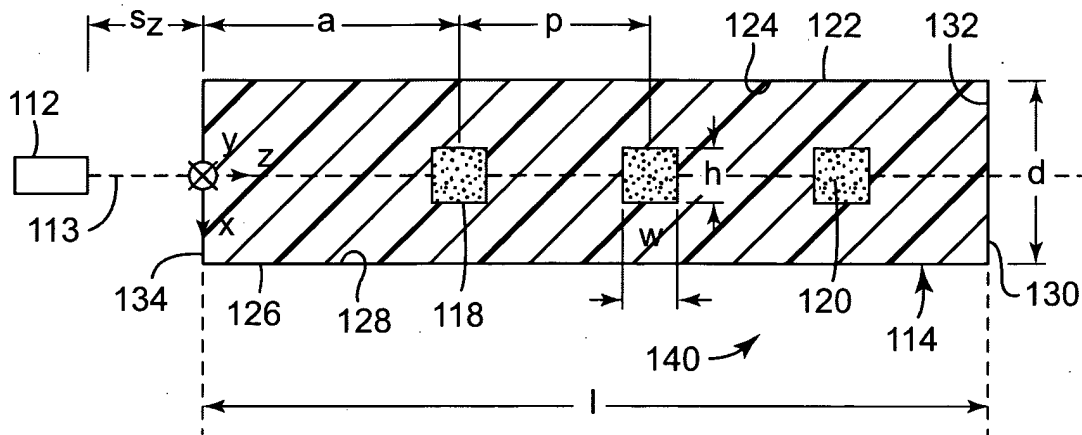


FIG. 2A

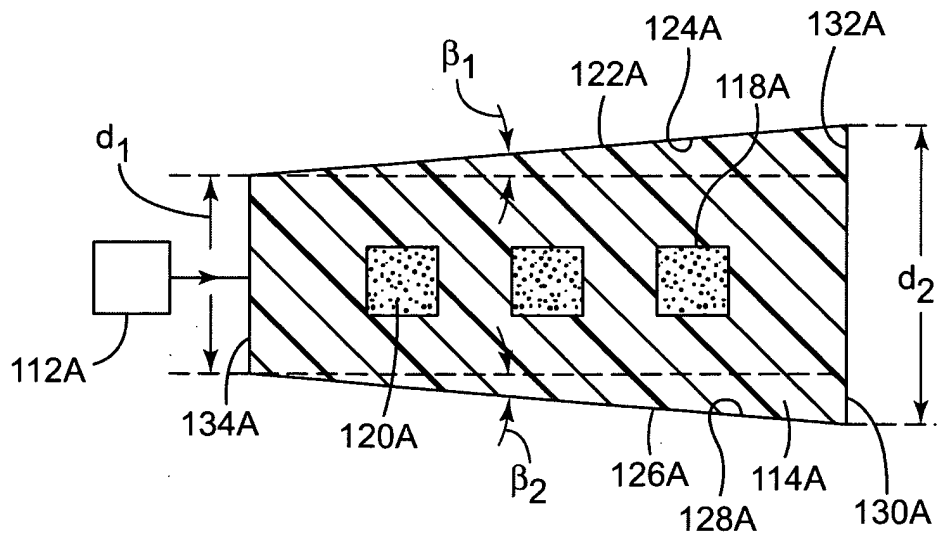


FIG. 2B

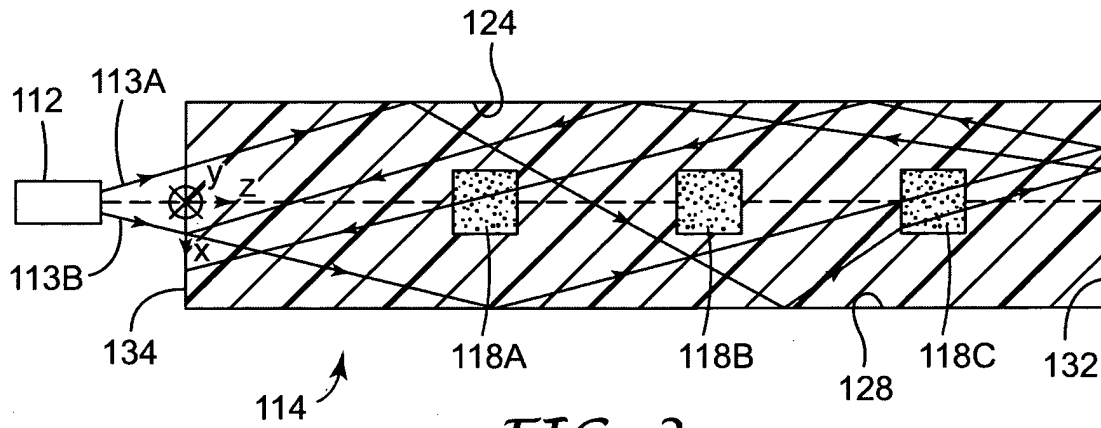


FIG. 3

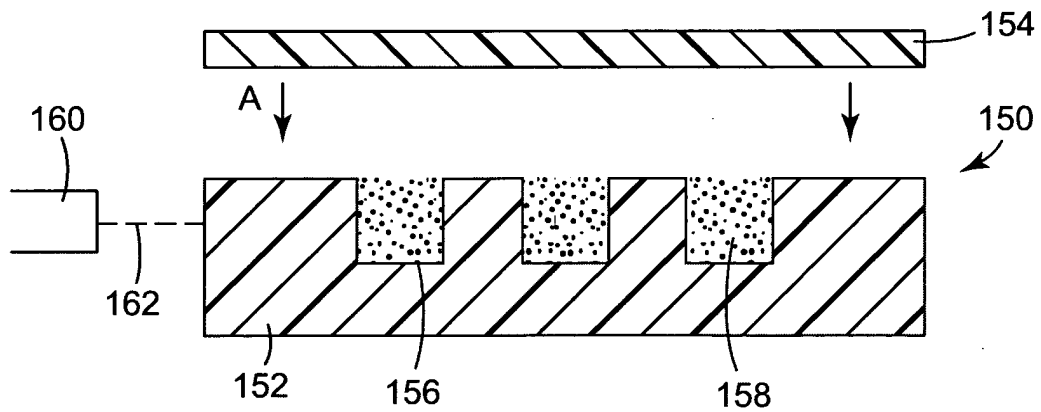


FIG. 4

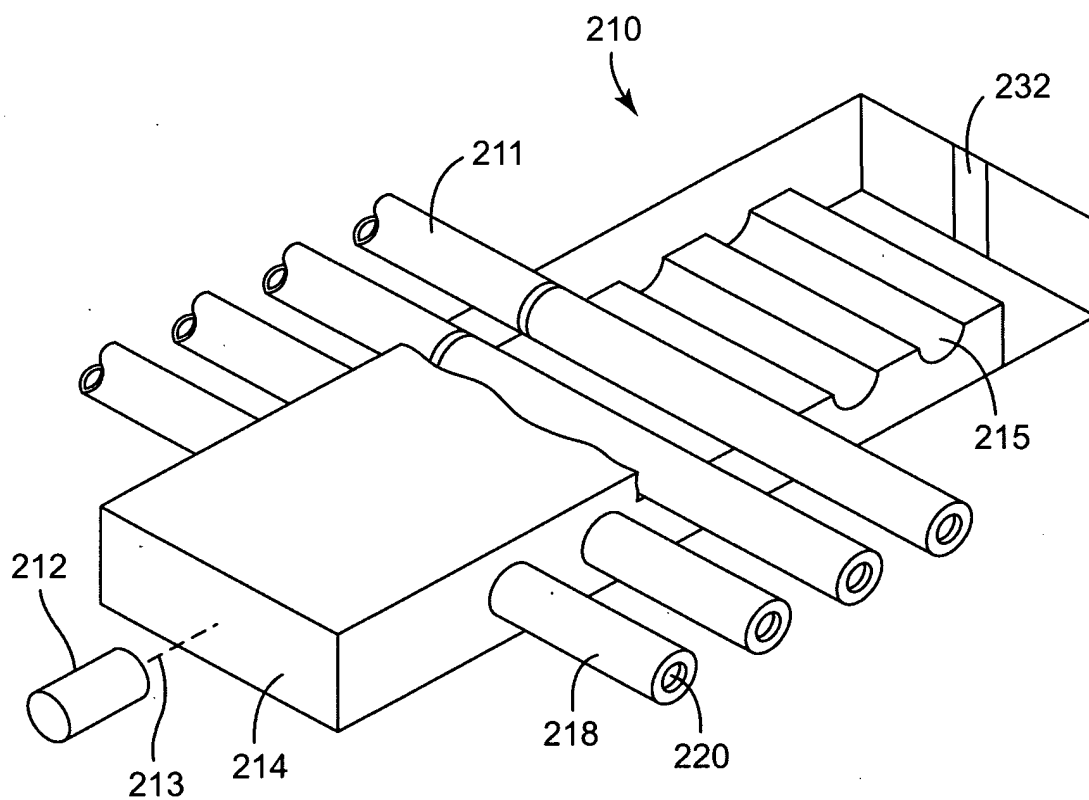


FIG. 5

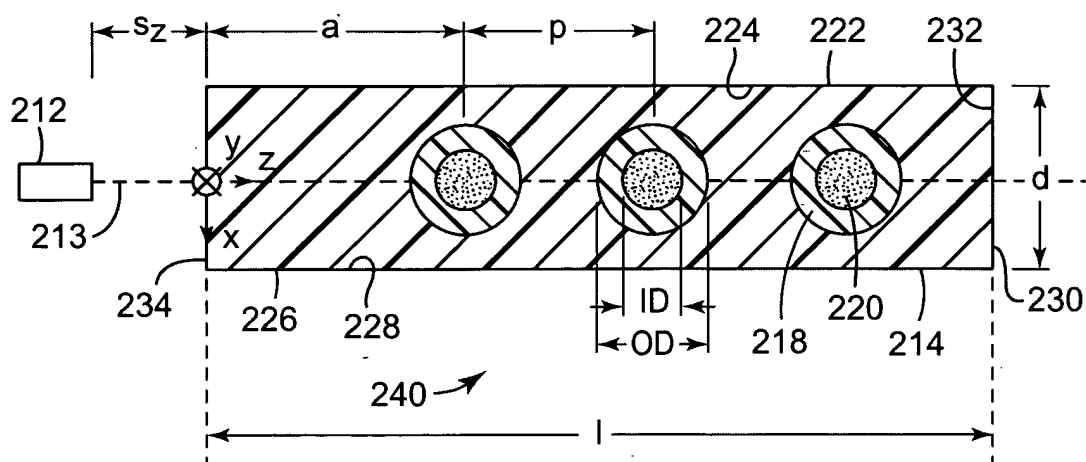
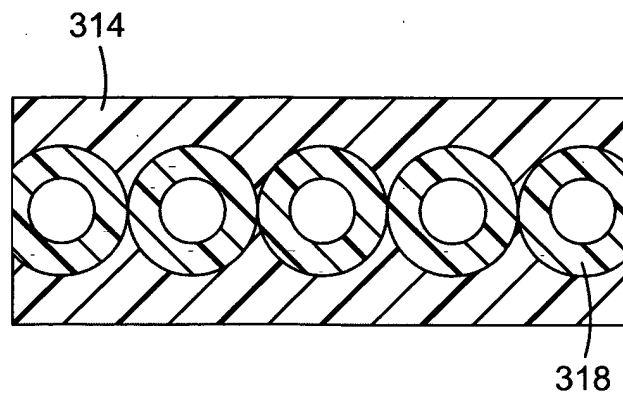
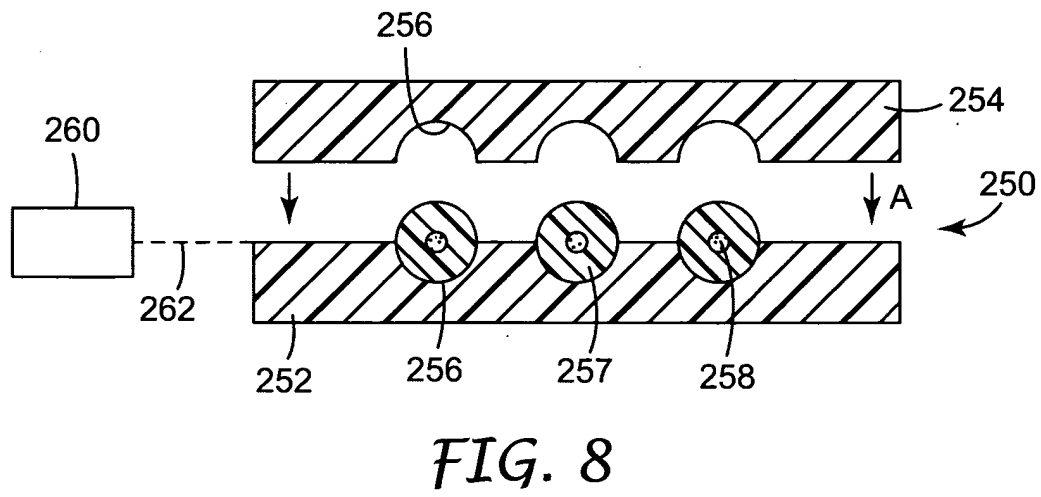
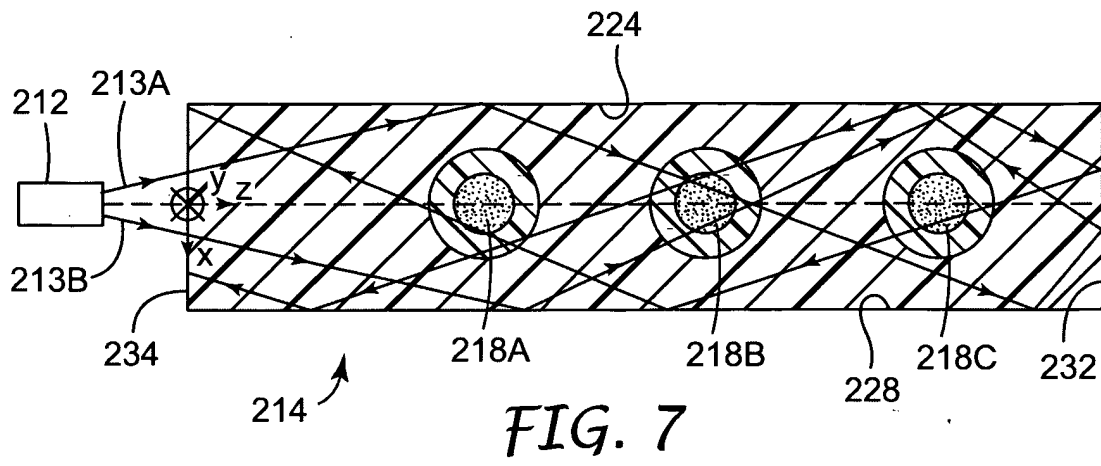


FIG. 6



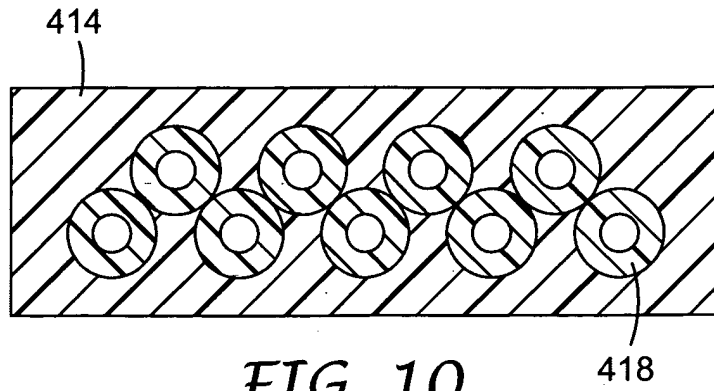


FIG. 10

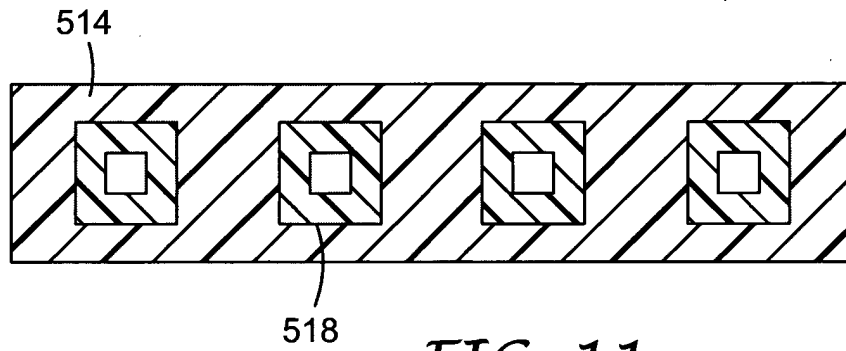


FIG. 11

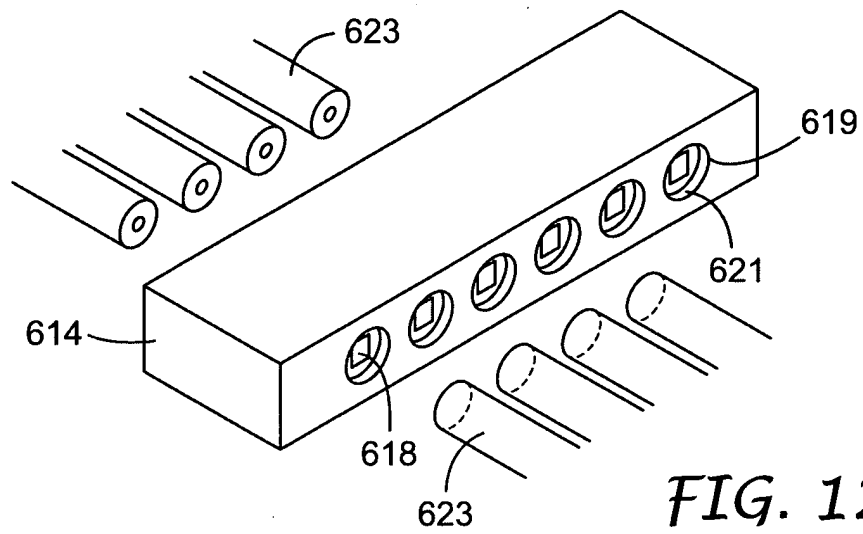
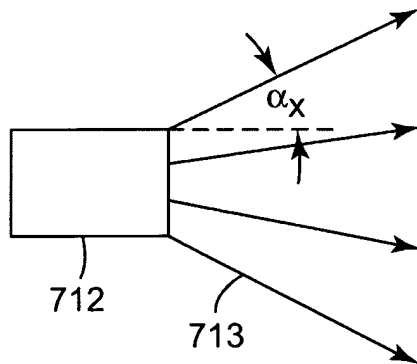
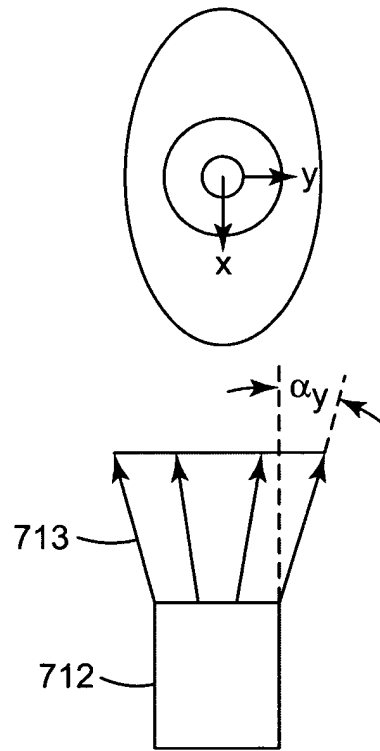
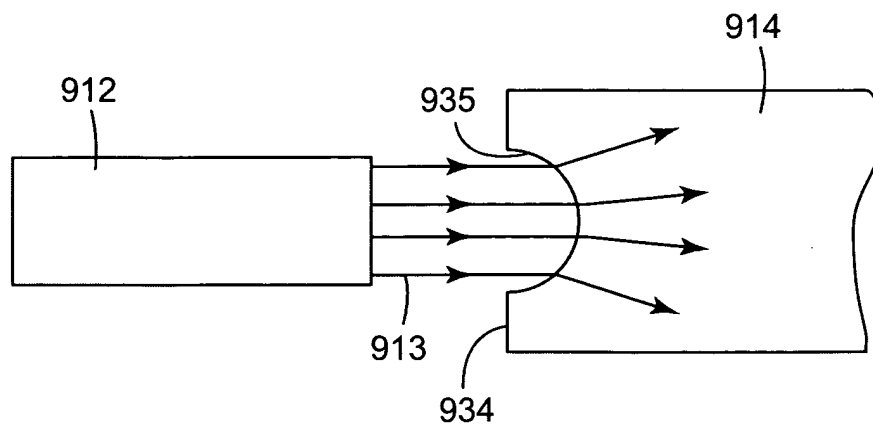
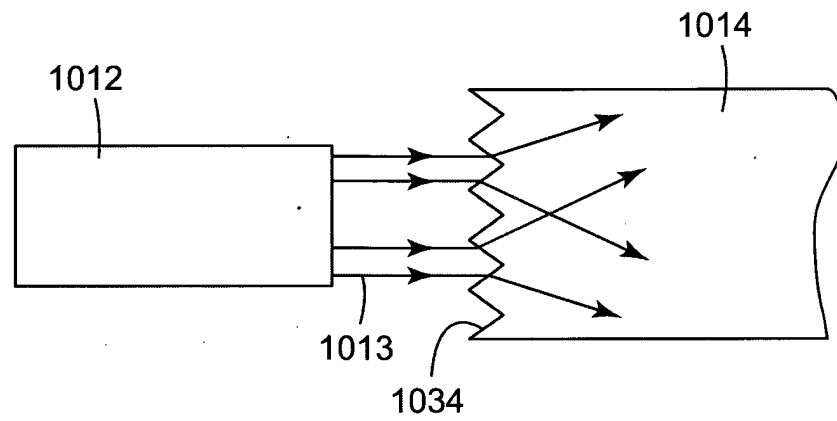
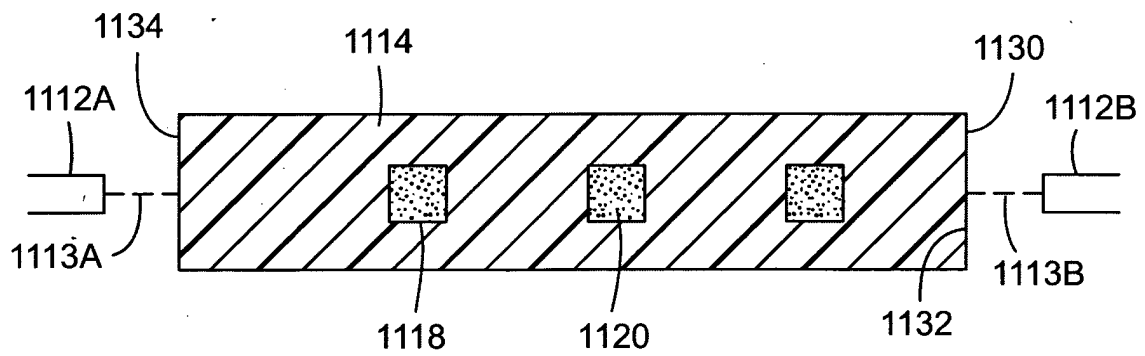
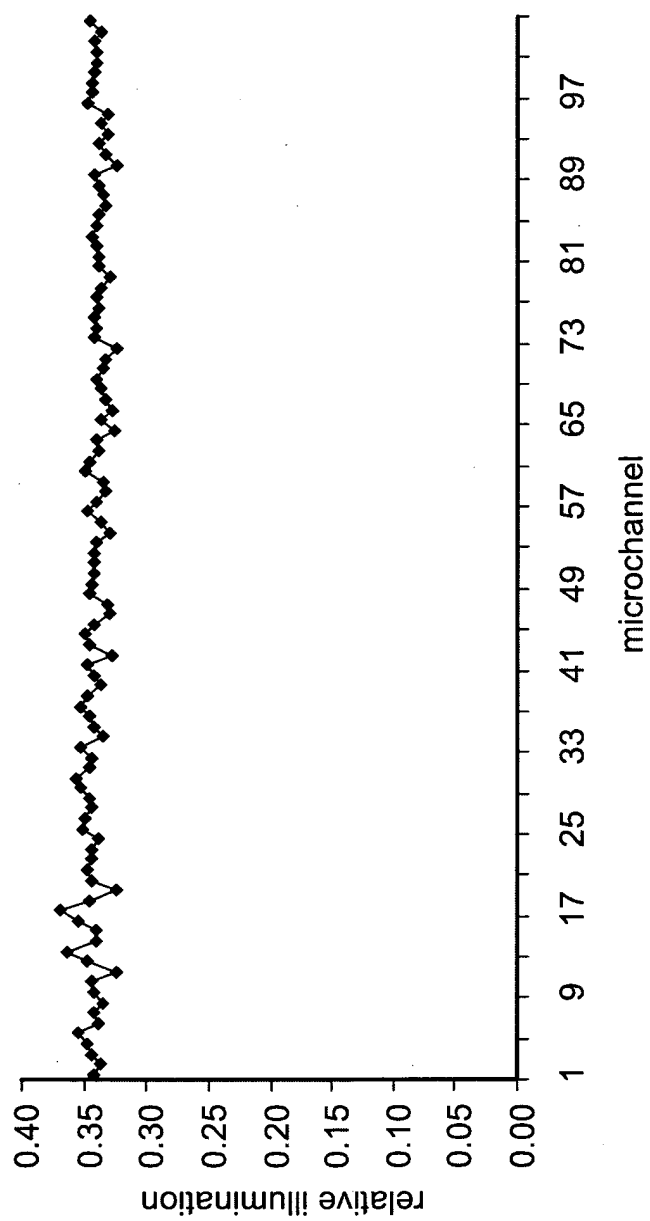


FIG. 12

*FIG. 13A**FIG. 13B**FIG. 14*

*FIG. 15**FIG. 16*

*FIG. 17*

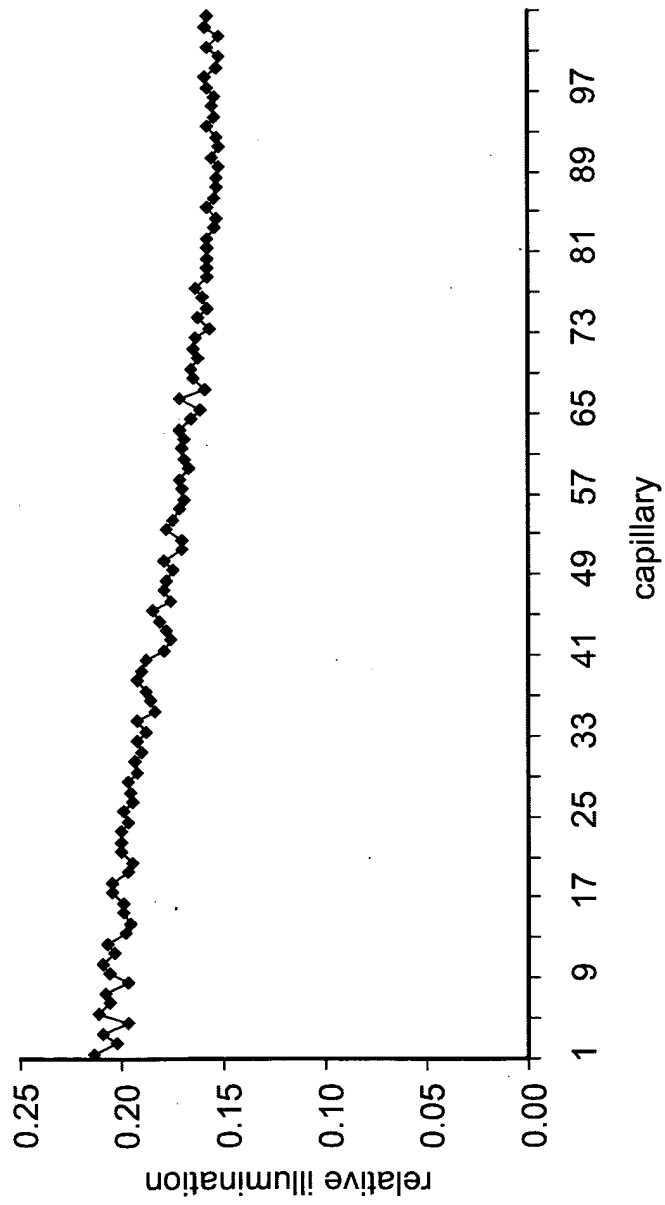


FIG. 18

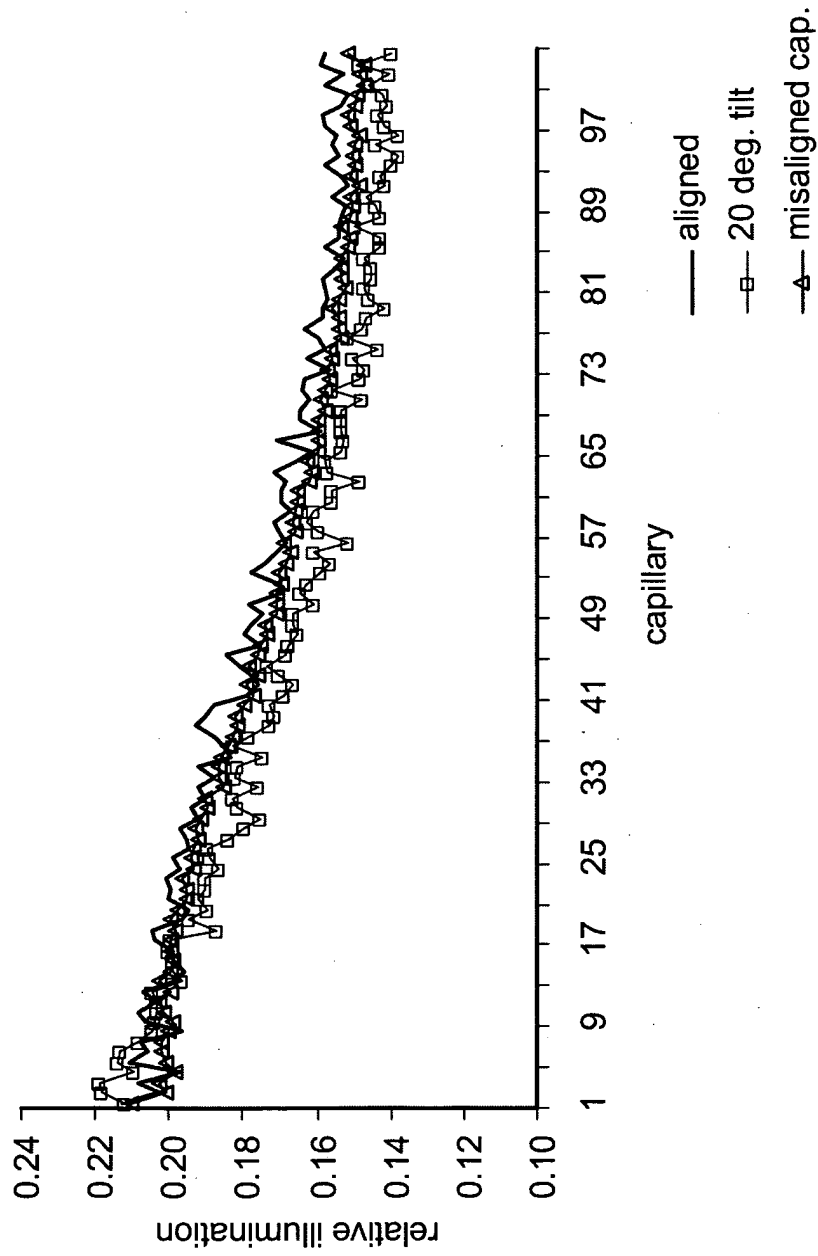
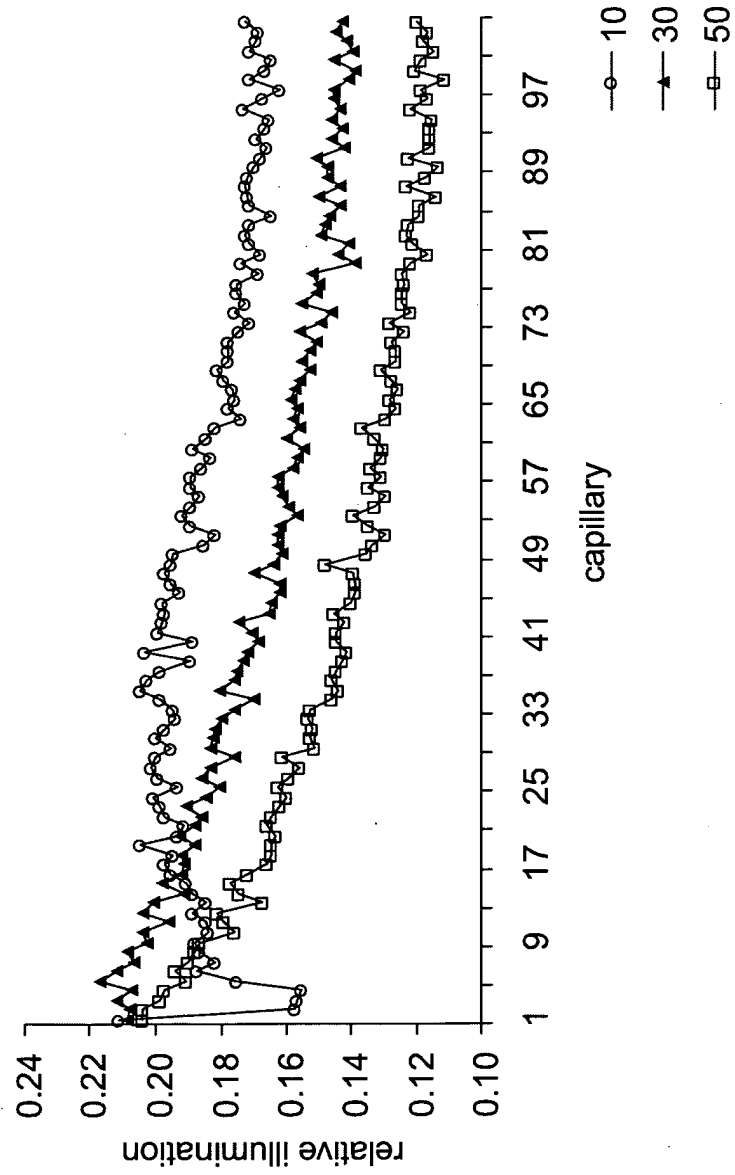


FIG. 19

*FIG. 20*

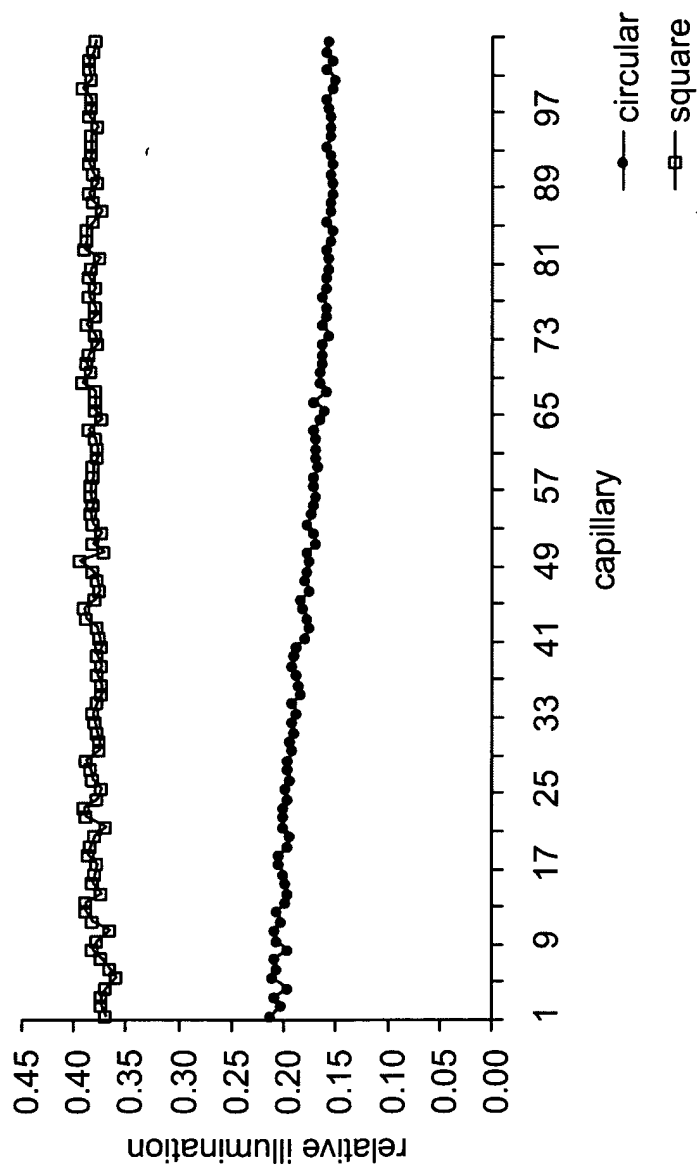
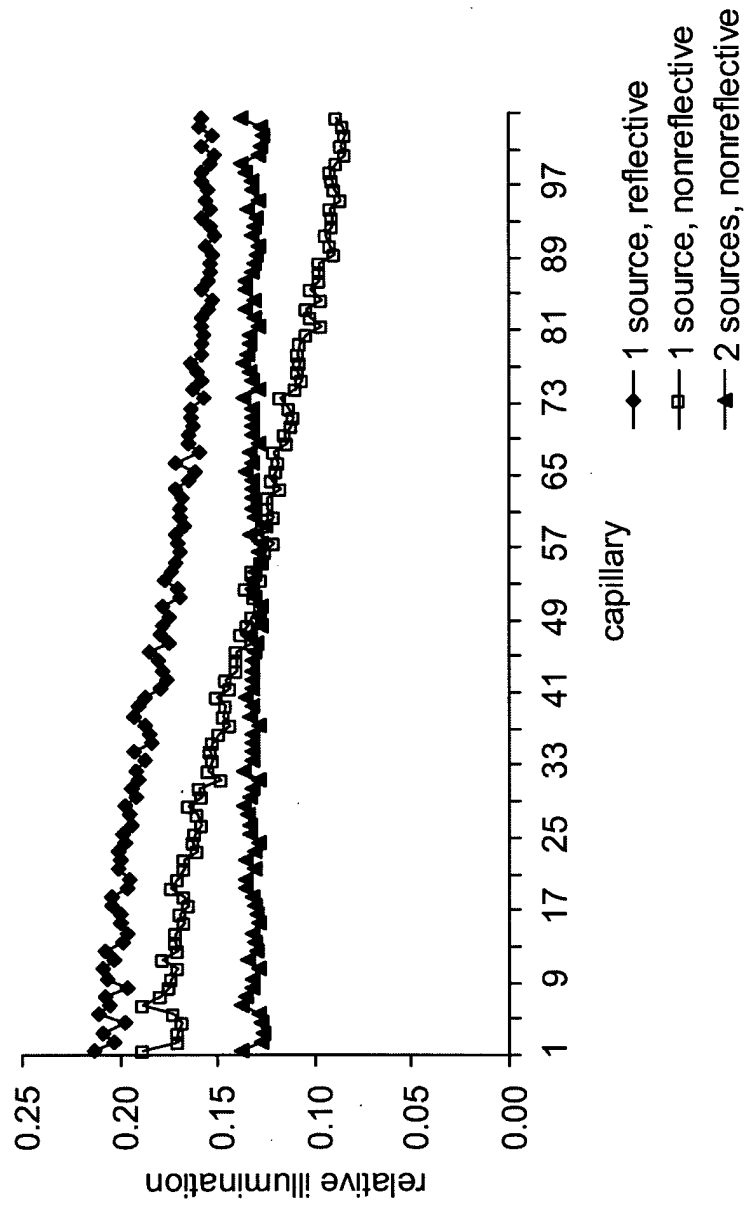


FIG. 21

*FIG. 22*